REMOVAL ASSESSMENT REPORT

FOR

WILCOX OIL COMPANY SUPERFUND SITE
WEST 221ST STREET SOUTH/REFINERY ROAD
BRISTOW, CREEK COUNTY, OKLAHOMA

Prepared for

U.S. Environmental Protection Agency Region 6
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EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (EPA) tasked Weston Solutions, Inc. (WESTON®), the EPA Region 6 Superfund Technical Assessment and Response Team (START-3) contractor (EPA team), to conduct a removal assessment at the Wilcox Oil Company Superfund Site (Site) located near Bristow, Creek County, Oklahoma.

The EPA team conducted the removal assessment activities in two phases. Phase 1 was conducted 08 - 11 December 2014. During Phase 1, a total of 187 soil samples (including duplicate quality assurance/quality control (QA/QC samples) were collected for laboratory analysis. A total of 185 composite samples were collected from 57 grids and 2 locations along the banks of a historical pond and analyzed for lead by Method SW-846 6010. The 2 grab samples (Pit 1 and Pit 2) were collected from a potential waste pit identified in previous investigations. The 2 grab samples were analyzed for Target Analyte List (TAL) metals by Method SW-846 6010, volatile organic compounds (VOCs) by Method SW-846 5035/8260, semi-volatile organic compounds (SVOCs) by Method SW-846 8270, and total petroleum hydrocarbons (TPH) by Method 1005.

Phase 2 was conducted from 18 May to 12 June 2015. During this phase, 240 soil samples (including duplicate QA/QC samples) were collected and analyzed for TAL metals, including mercury, following EPA Contract Laboratory Program (CLP) Method ISM01.3, and VOCs, SVOCs, and pesticides/aroclors target compound list by EPA CLP Method SOM01.2. In addition to the soil assessment, the Emergency and Rapid Response Services (ERRS) contractor installed fencing around the former Lorraine process area to restrict access.

A review of sampling analytical results indicated that in Phase 1 lead, benzo (a) anthracene, and benzo (a) pyrene are present above their respective EPA Removal Management Levels (RMLs). Phase 2 results indicated cadmium, cobalt, iron, manganese, and benzo (a) pyrene are present in soil above the EPA RMLs.

This report describes the technical scope of work completed as part of TDD No. 5/WESTON-042-15-004 under Contract No. EP-W-06-042 for EPA Region 6. The EPA On-scene

Coordinator (OSC) was Mark Hayes, and the EPA Project Team Leader (PTL) was Derrick Cobb.

[X] The EPA Task Monitor did not provide final approval of this report prior to the completion date of the work assignment. Therefore, Weston Solutions, Inc. has submitted this report absent the Task Monitor's approval.

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1. INTRODUCTION

Weston Solutions, Inc. (WESTON®), the Superfund Technical Assessment and Response Team (START-3) Contractor (EPA team), was tasked by the U.S. Environmental Protection Agency (EPA) Region 6 Prevention and Response Branch (PRB) under Contract Number EP-W-06-042, Technical Direction Document (TDD) No. 5/WESTON-042-15-004 (Appendix F) to conduct a removal assessment at the Wilcox Oil Company Superfund Site (Wilcox) located near Bristow, Creek County, Oklahoma. Site coordinates are Latitude 35.842144° North and Longitude 96.381456° West. A Site Location Map is provided as Figure 1-1. All figures are provided as separate portable document format (PDF) files. The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Identification Number assigned to the Site is OK0001010917.

This removal assessment report has been prepared to describe the technical scope of work and activities completed at the Wilcox Site.

1.1 PROJECT OBJECTIVES

Technical assistance was provided to EPA Region 6 for performance of the Wilcox removal assessment to assist EPA in determining if the site presents a threat to public health or welfare of the United States or the environment in accordance with 40 *Code of Federal Regulations* (CFR) 300.415 as well as the nature and extent of such contamination.

The objective of the removal assessment was to investigate the nature and extent of site-related contaminants in the soil of residential properties built within the former refinery property boundaries or adjacent to the historical property boundaries associated with the Wilcox Site. To achieve this objective, a field sampling plan that focused on sample collection in the immediate vicinity of the residential properties was developed.

Phase 1 pit samples were analyzed for TAL metals, not including mercury, analyses by Method SW-846 6010, volatile organic compounds (VOCs) by Method SW846 5035/8260, total petroleum hydrocarbons (TPH) by Method 1005, and semi-volatile organic compound (SVOC) analyses by Method SW846 8270. Phase 1 residential soil samples collected to a depth of 1 foot below ground surface were analyzed for lead by Method SW-846 6010. Two surface soil

samples (0-3 inches) were collected along the banks of a historical pond and were analyzed for lead by Method SW-846 6010.

Phase 2 samples were analyzed for Target Analyte List (TAL) metals, including mercury, following EPA CLP Method ISM01.3, volatile organic target compound (VOC) list, semi-volatile target compound list (SVOC), and pesticides/aroclors target compound list by EPA CLP Method SOM01.2.

1.2 SCOPE OF WORK

The removal assessment sampling efforts were focused on residential yards to determine the location and extent of site-related contaminated soil associated with historical operations. The scope of work included the following activities:

- Develop a site-specific Quality Assurance Sampling Plan (QASP).
- Develop a Health and Safety Plan (HASP).
- Obtain access to the subject properties.
- Collect soil samples from a predetermined grid system.
- Review analytical sample data results and compare those analytical results to the EPA Removal Management Levels (RMLs).
- Prepare a removal assessment report.

The site-specific QASP and addendum are included as Appendix A. The site-specific health and safety plan prepared for the project will remain as part of the overall project file until requested by the EPA OSC.

1.3 REPORT FORMAT

This removal assessment report has been organized as follows:

- Section 1 - Introduction
- Section 2 - Background
- Section 3 - Actions Taken
- Section 4 - Sample Analyses and Data Evaluation
- Section 5 - Summary of Analytical Results

Figures referred to in this document are presented as separate PDF files.

2. BACKGROUND

Information regarding the site location and description, operational history, and a summary of previous investigations are included in this section.

2.1 SITE LOCATION AND DESCRIPTION

The Wilcox Oil Company Superfund Site (Site) is an abandoned and demolished oil refinery and associated tank farm located north of Bristow, Creek County, Oklahoma. The geographic coordinates of the Site are approximately 35°50'31" North latitude and 96°23'02" West longitude. A detailed title search in the Creek County Clerk office confirms that the property was used in oil refinery operations from approximately 1915 until November 1963. The former Lorraine refinery, including associated tank farm, operated under numerous companies from approximately 1915 to 1937 when the property was sold to Wilcox Oil and Gas Company. Wilcox Oil and Gas Company purchased refinery operations on the remaining acres east of the railroad tracks and operated as a crude oil refinery from the 1920s until the property was sold on 1 November 1963. The site encompasses approximately 140 to 150 acres. A Site Area Map is provided as Figure 2-1.

The site is flanked by Route 66 to the west; a residential area and Turner Turnpike to the northwest and north; Sand Creek to the southwest; and residential, agricultural, and wooded areas to the east and south. The topography in the vicinity of the site slopes to the south. Surface water runoff would follow the topography in the vicinity of the site. There are several fresh-water ponds on the site, and some local residents indicated that, historically, fishing has occurred. Two intermittent streams drain the eastern and western portions of the site. These streams flow south into Sand Creek.

The former Wilcox Process Area is fenced while residential and agricultural properties on the site are partially fenced with barbed wire. There was no fencing around the former Lorraine Process area; however, as part of this removal assessment, a chain-link fence was installed around the property.

The Site can be divided into five major former operational areas: the Wilcox refinery, the Lorraine refinery, the north tank farm, the east tank farm, and the loading dock area.

- The former Wilcox refinery area is fenced and covers approximately 26 acres. Most of the equipment and storage tanks that remained on-site in 1963 were auctioned and have been salvaged for scrap iron by private land owners, and what remains are in ruins. Four aboveground storage tanks (ASTs) (12,500 gallons each) remain standing, in addition to a number of buildings, discarded drums and pieces of scrap iron and piping. There are multiple areas of stressed vegetation, barren areas, and visible black tarry waste of a hydrocarbon nature. A building in the northern part of the former refinery has been converted to a residence. An intermittent creek flows southward across the eastern portion of the refinery area through a small pond in the southeast corner of the refinery area and into Sand Creek.

- The former Lorraine refinery area covers approximately 8 acres and includes the southwestern portion of the Site, south of Refinery Road and west of the railroad. No refinery structures remain in the processing area. The First Assembly of God Church, a playground, and one residence are located here. There are multiple areas of stressed vegetation, barren areas, and visible black tarry waste of a hydrocarbon nature.

- The East tank farm was a large crude oil storage area/tank farm covering approximately 80 acres and contains pits, ponds, and a number of circular berms that surrounded tank locations. All of the tanks have been cut down and removed; however, remnants of the tank locations remain and are visible. Many of the berms surrounding the pits, ponds, and former tanks have been cut or leveled. An intermittent creek is located in the eastern portion of the tank farm and flows south to Sand Creek. A pumping or gas compressor station exists in the north-central portion of the Site, and an active pipeline crosses from northwest to southeast across the middle of the Site. There are four residences located on top of or directly next to former tank locations. There are multiple areas of stressed vegetation, barren areas, and visible black tarry waste of a hydrocarbon nature. Waste was also observed in several drainage channels that empty into Sand Creek.

- The North tank farm was a crude and fuel oil storage area consisting of approximately 20 acres. No refinery structures remain in the product storage area, and all tanks have been cut down and removed. Remnants of the tank locations are not visible, and historic locations are difficult to pinpoint. One residence is located in this area.

- The loading dock area is approximately 7 acres and was used for loading and unloading product by rail. Just a few refinery structures/supports remain and are generally located parallel to the existing rail lines. There are multiple areas of stressed vegetation, barren areas, and visible black tarry waste of a hydrocarbon nature.

2.2 OPERATIONAL HISTORY

A modern skimming and cracking plant was constructed in 1929. The upgraded facility had an operating capacity of 4,000 barrels of crude oil per day. The main components of the system consisted of a skimming plant, cracking unit, and re-distillation battery with a vapor recovery system and continuous treating equipment. The crude oil was brought directly from the field, eliminating storage and handling facilities, but resulting in crude oil with high sediment and water.

Sanborn fire insurance maps can be used to understand historical property usage. The Wilcox Oil and Gas Company and Lorraine Refining Company Sanborn Insurance Maps indicate that the properties contained approximately 80 storage tanks of various sizes, a cooling pond, and approximately 10 buildings housing refinery operations. The maps also indicate that crude oil, fuel oil, gas oil, distillate, kerosene, naptha, and benzene (petroleum ether) were all stored on the property.

After the refinery operations ceased and most of the tanks and buildings were demolished and sold for scrap, the property was sold to private interests. Beginning in 1975 with the construction of the church, private residences were constructed on 6 parcels of land that were part of the former refinery operations. The most recent being constructed in 2003/2004. One former building associated with the refinery was repurposed as a residence. As a result, there is a total of seven residences on the Site, all of which are located on former tank or refinery operations locations. Three of the residences located on the eastern portion of the Site are known to use water from domestic/private wells. The drainage pattern of the Site is primarily toward Sand Creek that serves as the western and southwestern boundaries of the Site. Two intermittent streams and several drainage channels cross the portion of the Site east of the railroad and flow into Sand Creek.

The refinery waste source areas of concern include a backfilled oily waste pond and pit, a breached settling pond, a former pond apparently backfilled with solid refinery waste, and a number of former tank storage areas. The contaminants of concern are metals and organic compounds (Total Petroleum Hydrocarbons (TPH) and Polycyclic Aromatic Hydrocarbons

[PAHs]). These potential contaminants of concern are found in soil, sediment, and waste material.

2.3 SUMMARY OF PREVIOUS INVESTIGATIONS

Multiple investigations have been performed on the Site since 1994. These documents were used to summarize the Site background and operational history described above.

- Preliminary Assessment (PA) was performed at the former Wilcox Refinery Site by the Oklahoma Department of Environmental Quality (ODEQ) in December 1994.
- Expand Site Inspection (ESI) was performed at the former Wilcox Refinery Site for the Environmental Protection Agency (EPA) in March 1997.
- Site Assessment (SA) was performed at the former Wilcox Refinery Site by EPA in March 1999.
- PA was performed at the former Lorraine Refinery Site by ODEQ in September 2008.
- Site Inspection (SI) was performed at the former Lorraine Refinery Site by ODEQ in August 2009.
- ESI was performed at the former Lorraine Refinery Site by ODEQ in September 2010.
- ESI was performed at the former Wilcox Refinery Site by ODEQ in September 2011.
- Hazard Ranking System Package was completed in May 2013.

In 2014, the EPA Emergency Rapid Response Services (ERRS) contractor capped and locked an abandoned drinking water well located near the former location of the First Assembly of God Church to the west of the site. ERRS also installed a fence with signage around an oily sludge pit located on a residential property developed within the historical refinery boundary (Property 001).

3. ACTIONS TAKEN

The EPA team conducted removal assessment activities in two phases in general accordance with the EPA team's site-specific QASP and HASP prepared as part of the TDD requirements. Phase 1 was conducted 08 - 11 December 2014, and Phase 2 was conducted 18 May 2015 through 12 June 2015. The field sampling strategy focused on collecting soil samples from residential properties that have been built on or in close proximity to the former Wilcox Site. A Site Overview Map is included as Figure 3-1. Soil sampling, sample collection methods used, field quality assurance/quality control sampling, and investigation-derived waste management are described in the following text.

EPA Guidance Documents and WESTON Standard Operating Procedures (SOPs), including sample collection techniques, were utilized during field assessment activities. Field logbook notes are included in Appendix B. Digital photographs of site-related activities are presented in Appendix C.

Prior to initiation of field work, the Oklahoma One-Call System was contacted, as well as local municipalities (e.g., power, phone, gas, cable, water, sewer, etc.) 48 hours prior to the sampling event to locate underground utilities.

3.1 SOIL SAMPLING

Prior to initiating the sampling activities in Phase 1, EPA gained access to one targeted residential property (Property 001) within the former Wilcox Site boundary. As part of the assessment activities, the EPA team collected 187 soil samples (including duplicate QA/QC samples) from a total of 57 grids. Grids varied in size based on potential exposure to the soil (areas with high potential utilized smaller grids, areas with less exposure utilized larger grids). Grids immediately surrounding the house, driveway, and garage were as small as 25 feet by 25 feet. Grids with less exposure ranged in size from 50 feet by 50 feet to as large as 100 feet by 100 feet. Grid locations were established using Global Positioning System (GPS) technology to obtain horizontal control of the sample locations. Two samples were also taken at the request of the EPA OSC from soil on the bank of an on-site pond and soil that was affected with a tar-like substance from an unknown source. Figure 3-2 presents the Sample Location Map for Phase 1.

In each grid, 5-point composite soil samples were collected utilizing a combination of hand-auger and/or direct-push technology. Dedicated acetate liners were used to reduce the possibility of cross-contamination between sample locations. Five separate pushes were conducted within each grid. Samples were collected from three discrete depth intervals: 0 to 3 inches bgs, 3 to 6 inches bgs, and 6 to 12 inches bgs. Samples were composited per depth interval from the five aliquots within each grid and placed in dedicated plastic bags, homogenized, and transferred to clean, unused sample containers. Two grab samples were collected from the surface (0-3 inches) from a suspected waste pit located on the property.

Following sample collection, each sample container was labeled and placed in a shipping container (e.g., cooler) with ice while on-site. At the end of each day, each sample shipping container was repacked with ice and sufficient packing material (e.g., bubble wrap) to prevent movement of the cooler and breakage during shipment.

Prior to initiating Phase 2, EPA gained access to 9 residential properties. Phase 2 work was conducted in two sampling events due to heavy rain in the area. The first event was conducted 18 May to 22 May 2015, and the second sampling event was conducted 01 June to 04 June 2015. After completing the Phase 2 field work, a subset of samples was collected for metals analysis. The subset of samples was sieved to remove foreign objects from the samples. These samples were allowed to dry for 4 days prior to sieving due to the high-moisture content. The sieved samples were collected from 08 June to 12 June 2015. The EPA team collected a total of 240 soil samples (including duplicate QA/QC samples) from a total of 52 grids from 9 properties on and around the Wilcox Site (5 properties located on the site and 4 properties located adjacent to the site). A grid system was established based on potential exposure to the soils in the immediate vicinity of the residential properties or any other structures of high use (i.e., garages/sheds). Each grid was approximately 100 feet by 100 feet. Grid locations were established using Global Positioning System (GPS) technology to obtain horizontal control of the sample locations. At the direction of the EPA OSC, select locations were pushed to deeper depths to visually investigate the presence of potential refinery waste. The Sample Location Map for Phase 2 is present as Figure 3-3.

In each grid, composite soil samples were collected utilizing a direct-push technology. Dedicated acetate liners were used to reduce the possibility of cross-contamination between sample locations. Five separate pushes were conducted within each grid. Samples were collected from four discrete depth intervals: 0 to 2 inches bgs, 2 to 6 inches bgs, 6 to 12 inches bgs, and 12 to 24 inches bgs. Samples were composited per interval from the five aliquots within each grid and placed in dedicated plastic bags, homogenized, and transferred to clean, unused sample containers. VOC samples were collected from one of the aliquots prior to compositing and homogenization to minimize volatilization loss caused by the homogenization. Following sample collection, each sample container was labeled and tagged according to the EPA CLP procedures and placed in a shipping container (e.g., cooler) with ice while on-site. At the end of each day, each sample shipping container was repacked with ice and sufficient packing material (e.g., bubble wrap) to prevent cooler movement and breakage during shipment.

The shipping containers for both phases were sealed and shipped via overnight delivery service to the participating EPA CLP laboratories. SCRIBE software was utilized to generate chain-of-custody forms, label information, and to manage and track sample information.

Based on historical site operations and historical aerial photographs, selected grids were investigated below 24 inches bgs. These grids were identified on Properties 002, 006, 008, and 011. The center point of each grid was advanced to a maximum depth of 8 feet bgs or refusal (i.e., bedrock). Visual observations were noted (see property-specific maps referenced in Section 5). No analytical samples were collected from these at-depth soil investigation borings.

3.2 FIELD QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

The EPA team collected blind field duplicates and equipment rinsate and field blanks during the field activities as follows:

- A total of 15 blind field duplicate samples were collected during the Phase 1 soil sampling activity. During the Phase 2 activities, 21 blind field duplicate samples were collected. Duplicates were collected as splits of the normal samples. Analysis of the duplicates provides quality assurance of sampling procedures and laboratory analytical data by evaluating reproducibility of results.
- A total of 6 equipment rinsate samples were taken during Phase 2 sampling activities. This was accomplished by pouring laboratory-grade deionized water over

decontaminated equipment (e.g., core barrels and or slab bar tube) and collecting the rinse water in appropriate sample containers. Equipment rinsate blanks were collected to provide information regarding the adequacy of the equipment decontamination procedures.

- A total of 5 field blank samples were taken during Phase 2 sampling activities. This was accomplished by pouring laboratory-grade deionized water in appropriate sample containers while standing on-site. Field blanks were collected to evaluate the potential contamination of a sample by contaminants from a source not associated with the sample.
- One trip blank sample was collected during the Phase 1 sampling activity. A total of 11 trip blank samples were collected during Phase 2 sampling activities. Trip blanks are pre-prepared by the laboratory by pouring laboratory-grade deionized water in appropriate sample containers. These samples are placed in coolers that contain VOC samples and are used to ensure that no cross contamination between samples occurred during transportation.

Other quality assurance (QA) samples included temperature blanks placed in each cooler to evaluate the temperature of samples upon arrival at the participating EPA CLP laboratories.

3.3 INVESTIGATION-DERIVED WASTE MANAGEMENT

To reduce decontamination activities, dedicated sampling equipment was used whenever possible. This equipment and the other investigation-derived waste (IDW) produced during the field activities were managed on-site as part of the removal assessment activities. Acetate liners used during the sampling activities were placed in drum liners and disposed.

3.4 FENCE INSTALLATION

The former Lorraine Process Area is located on the western boundary of the site. Based on historical site investigations, a potential exposure to waste material was identified. As a result, the EPA Region 6 ERRS contractor was mobilized to the site to install fencing around the area to restrict access and minimize potential exposure. Additional fencing was installed at Property 001 based on Phase I soil sampling results. Grid 050 was identified as having potential waste material, and fencing was installed around the associated grid to minimize exposure to the soil.

4. SAMPLE ANALYSES AND DATA EVALUATION

In Phase 1, Spectrum Analytical Inc. conducted sample analyses and data validation was performed by the EPA team. In Phase 2, sample analysis was conducted by both the EPA Region 6 Laboratory and the EPA-designated CLP Laboratory (ALS Environmental). The data review/data validation was performed by the EPA Region 6 Environmental Services Assistance Team (ESAT). These tasks were conducted in accordance with EPA CLP guidelines, WESTON's Quality Assurance Program, and the WESTON site-specific QASP.

As part of the overall removal assessment effort, a total of 427 soil samples (including duplicate QA/QC samples) were collected for laboratory analysis. A standard data management system that includes using bound field logbooks, site photographs, sample management and tracking procedures, document control, and inventory procedures for the laboratory data was utilized. SCRIBE software was utilized to create chain-of-custody forms and labels including managing and tracking sample information for samples submitted to the EPA Region 6 Laboratory and EPA-designated CLP laboratory.

Information regarding laboratory analyses, data validation, and data reporting tasks are discussed in the following subsections.

4.1 LABORATORY ANALYSES, DATA VALIDATION, AND DATA REPORTING

The laboratories reported the analytical results in data packages meeting EPA CLP requirements. The laboratory documentation in these data packages includes records of instrument readings, calculations, calibrations, and quality assurance checks.

To meet the sample capacity requirements of the Technical Direction Document (TDD) for Phase 1, the EPA team shipped 187 soil samples (including duplicate QA/QC samples) to Spectrum Analytical, Inc., in Tampa, Florida. Phase 2 samples were divided between the Region 6 Laboratory in Houston, Texas and the EPA CLP-designated laboratory (ALS Laboratory in Salt Lake City, Utah) for analysis.

Appendix D includes the analytical data packages including data validation comments submitted by each laboratory assigned to the project by EPA.

4.2 DATA VALIDATION

The EPA Region 6 ESAT data review team conducted a review of the CLP data packages. Samples analyzed by the EPA Region 6 laboratory underwent a full data review by the EPA Region analytical team. Data validation was conducted in accordance with the EPA Contract Laboratory Program *National Functional Guidelines for Superfund Organic Methods* Data Review June 2008 and *Inorganic Superfund Data Review* January 2010.

The data packages were reviewed to verify that they met the EPA technical requirements and Quality Assurance (QA) guidelines established for the respective analytical methods. The following list includes the items evaluated for each laboratory sample delivery group (as applicable):

- The chain-of-custody was reviewed to verify the sample IDs and the analyses requested.
- The sample receipt temperature was reviewed to verify that the cooler temperature was within acceptable range.
- Holding times were reviewed to verify the samples were extracted and analyzed within the required holding time.
- Laboratory blanks were reviewed to determine whether laboratory contamination was present.
- Matrix spike/matrix spike duplicate samples were reviewed to determine whether matrix interference was present and to determine if laboratory precision was within the acceptable range.
- Laboratory control samples and/or laboratory control sample duplicates were reviewed to verify the accuracy of the method.
- Surrogate recoveries were reviewed to verify that the recoveries were within the acceptable range.
- Initial calibrations were reviewed to confirm conformance to method acceptance criteria for percent recovery and/or correlation coefficient.
- Continuing calibrations were reviewed to confirm that calibration verification was performed before sample analysis and at the method-specified frequency. The calibration verification percent recoveries were reviewed and compared to acceptance criteria.
- Internal standards were reviewed to verify that the recoveries were within the acceptable range.
- Equipment rinsate blanks were reviewed to verify adequate field decontamination procedures.

- Field duplicates were reviewed to verify that field precision was within the acceptable range.
- Reporting limits were reviewed to confirm that they were adjusted to reflect dilution factors and percent solids, if applicable.
- Sample results were reviewed to confirm that the detected concentration was within the instrument calibration range. If the concentration exceeded the instrument calibration range, the data was reviewed to determine if the sample was re-analyzed at a secondary dilution.
- Calculations were performed for sample results from each analytical package to confirm the final result reported by the laboratory. These calculations consider the result produced by the analytical instrument, sample volume, sample weight, calibration correlations, dilution factor, and percent solids, if applicable.

In summary, the ESAT data validation team indicated that the data are of acceptable overall quality for their intended use in meeting the objectives of the removal assessment.

5. SUMMARY OF ANALYTICAL RESULTS

The EPA team conducted Phase 1 removal assessment activities from 08 December to 11 December 2014 in general accordance with the EPA team's site-specific QASP and HASP prepared as part of the TDD requirements. A total of 187 soil samples (including duplicate QA/QC samples) were collected and submitted for analyses. The two pit samples were analyzed for TAL metals (not including mercury), VOCs, SVOCs, and TPH, while the remaining 185 samples were analyzed for lead.

Phase 2 removal assessment activities were conducted in two sampling events that took place from 18 May to 12 June 2015 in general accordance with the EPA team's site-specific QASP and HASP prepared as part of the TDD requirements. A total of 240 samples (including duplicate QA/QC samples) were submitted to EPA Region 6 Laboratory and EPA-designated CLP laboratory for analyses for TAL metals, including mercury, VOCs, SVOCs, and pesticides/aroclors. The laboratory data results were subsequently validated by the EPA ESAT team. Samples analyzed by the EPA Region 6 Laboratory underwent a through data review by the EPA Region 6 analytical team. Analytical results were compared to EPA Removal Management Levels (RMLs). Soil sample analytical exceedance summary tables are included as Appendix E.

A review of the sample results for Phase 1 presented in Tables 1 and 2 of Appendix E indicates that Lead located in soils of Grid 050 exceed the EPA RML of 400 milligrams per kilogram (mg/kg) in 6-inch (906 mg/kg) and 12-inch (5,850 mg/kg) depth samples. The Pit-02 sample indicates benzo(a)anthracene (18.4 mg/kg) and benzo(a)pyrene (11 mg/kg) in the soil above the respective RMLs of 15 mg/kg and 1.5 mg/kg. A map illustrating these results is presented as Figure 5-1.

A review of the sample results for Phase 2 indicates that Property 008 had soil exceedances in Grid 001 and Grid 004. Grid 001 exceeded the 70 mg/kg RML for cadmium with a result of 80.2 mg/kg in the 0-3-inch sample. Grid 004 exceeded the 1.5 mg/kg RML for benzo(a)pyrene in soil from the 0-3-inch, 6-12-inch, and 12-24-inch samples with results of 1.5 mg/kg, 1.9 mg/kg, and 1.7 mg/kg respectively. Property 019 Grid 002 exceeded the 55,000 mg/kg RML for Iron in the 0-3-inch sample with a result of 72,700 mg/kg. The manganese RML (1,800 mg/kg) was

exceeded in the soil from Property 021, Grid 003, and 12-24-inch sample with a result of 1,880 mg/kg. Grid 005 from Property 021 also exceeded the Cobalt RML (23 mg/kg) in the 0-6-inch sample (61.2 mg/kg). Phase 2 sample results are presented in Table 3 of Appendix E. Based on historical site operations and historical aerial photographs, selected grids were investigated below 24 inches bgs. These grids were identified on Properties 002, 006, 008, and 011. The center point of each grid was advanced to a maximum depth of 8 feet bgs or refusal (i.e., bedrock). Maps illustrating the results, including visual observations of deeper pushes within the evaluation areas, are presented as Figure 5-2 through Figure 5-10.